

## **IN THE CLAIMS**

1 (Previously Presented). A method to reduce initialization time of a system, comprising:

storing at least a portion of the data accessed during initialization of the system in a non-volatile cache memory of the system; and

pinning at least a portion of the data stored in the non-volatile cache memory, wherein the pinning is performed during initialization of the system.

2 (Previously Presented). The method of claim 1, wherein storing comprises storing the data in a mass storage non-volatile cache memory.

3 (Previously Presented). The method of claim 1, wherein pinning comprises pinning the portion of data necessary for a system initialization.

4 (Previously Presented). The method of claim 1, wherein pinning comprises:  
storing metadata corresponding to the data stored in the non-volatile cache memory; and  
setting a state in the metadata to indicate that a corresponding line of data is pinned.

5 (Original). The method of claim 4, wherein storing the metadata comprises storing the metadata in a second memory.

6 (Original). The method of claim 4, wherein storing the metadata comprises storing the metadata in a volatile storage media.

7 (Previously Presented). A metadata stored in a system comprising:  
a first state to indicate a least recently used information of a corresponding line of initialization data in a non-volatile memory of the system; and

a second state to indicate whether a corresponding line of initialization data in the non-volatile memory is pinned.

8 (Previously Presented). The metadata of claim 7, further comprising:

a third state to indicate whether a corresponding line of initialization data in the non-volatile memory was present before a system initialization of the system.

9 (Previously Presented). The metadata of claim 7, wherein the metadata is stored in a volatile storage media, wherein the second state is set during initialization of the system.

10 (Previously Presented). A system comprising:

a cache including a first storage media to store cache data accessed during initialization of the system, the first storage media being a non-volatile storage media; and

a second storage media to store metadata for the cache data stored in the first storage media, the metadata including a state to indicate whether a corresponding line of data is pinned, wherein the state is set during initialization of the system.

11 (Original). The system of claim 10, wherein the cache is a mass storage cache.

12 (Original). The system of claim 10, wherein the second storage media is a volatile storage media.

13 (Original). The system of claim 10, wherein the second storage media is included in the cache.

14 (Original). The system of claim 10, wherein the cache is implemented as an add-in card.

15 (Previously Presented). A method comprising:

accessing a first memory during a system initialization, the first memory being a cache; and

pinning data accessed during the system initialization in the first memory, wherein the pinning occurs during the system initialization.

16 (Previously Presented). The method of claim 15, wherein the cache is a mass storage non-volatile cache.

17 (Original). The method of claim 15, further comprising:

limiting the pinning of data during the system initialization.

18 (Previously Presented). The method of claim 15, wherein the pinning comprises:  
storing metadata for the data stored in the first memory, the metadata including a first state to indicate whether a corresponding line of data is pinned; and  
setting a first state corresponding to the accessed data to indicate that the accessed data is pinned.

19 (Original). The method of claim 18, wherein the pinning of data further comprises:  
setting a timer upon the system initialization; and  
setting a first state corresponding to the accessed data until the timer expires.

20 (Original). The method of claim 18, wherein the pinning of data further comprises:  
setting a maximum amount of data to pin; and  
setting a first state corresponding to the accessed data until the maximum amount is exceeded.

21 (Original). The method of claim 18, wherein the metadata further includes a second state; and wherein the pinning of data further comprises:  
setting a second state for data that was present before system initialization, the setting of the second state to indicate that a corresponding data was present before the system initialization;  
setting a timer upon the system initialization;  
setting a maximum amount of data to pin;

setting a first state corresponding to the accessed data if the maximum amount is not exceeded and if the timer has not expired; and otherwise

clearing a first state corresponding to a pinned data and setting a first state corresponding to the accessed data if the second state corresponding to the pinned data is not set and the pinned data corresponding to the accessed data is set, and if the timer has not expired.

22 (Original). The method of claim 21, wherein the metadata further includes a third state to indicate the age of a corresponding line of data and the clearing of a first state comprises:

clearing the latest line of data if there is more than one line of pinned data whose second state is not set.

23 (Previously Presented). A system comprising:

a cache including a first storage media to access during a system initialization, the first storage media being non-volatile;

a second storage media to store metadata for data accessed during the system initialization, the metadata including a first state; and

a memory control hub to cause the first state to be set for data accessed during the system initialization, the setting of the first state to occur during the system initialization and to indicate that a corresponding line of data is pinned.

24 (Original). The system of claim 23, wherein the metadata further includes a second state; and wherein the memory control hub causes the second state to be set for data present before the system initialization, the setting of the second state to indicate that a corresponding line of data was present before the system initialization.

25 (Original). The system of claim 23, wherein the cache is a mass storage cache.

26 (Original). The system of claim 23, wherein the memory control hub limits the amount of data pinned.

27 (Original). The system of claim 23, wherein the second storage media is a volatile storage media.

28 (Original). The system of claim 23, wherein the second storage media is included in the cache.

29 (Original). The system of claim 23, wherein the cache is implemented as an add-in card.

30 (Previously Presented). A program loaded into a computer readable media comprising:

a first group of computer instructions to access data in a non-volatile cache of a system;

a second group of computer instructions to pin data accessed in the non-volatile cache, during initialization of the system.

Claim 31 (Canceled).

32 (Currently Amended). The program of claim 31 30, wherein the second group of computer instructions further includes computer instructions to limit the amount of data pinned.

33 (Previously Presented). A method to reduce initialization time of a system, comprising:

marking data stored in a non-volatile cache memory to prevent eviction of the data, wherein the marking occurs during initialization of the system.

34 (Previously Presented). The method of claim 33, wherein marking comprises marking data stored in a mass storage non-volatile disk cache memory.

35 (Previously Presented). The method of claim 33, wherein marking comprises marking data accessed during initialization of the system and further comprising storing the data accessed during initialization in the non-volatile cache memory.

36 (Previously Presented). The method of claim 33, wherein marking includes storing metadata corresponding to the data in a second memory different than the non-volatile cache memory, wherein the metadata includes a pinned bit that is set by a memory control hub to prevent eviction of the corresponding data stored in the non-volatile cache memory.

37 (Previously Presented). The method of claim 33, further comprising limiting the amount of data that is marked using either a timer or a maximum count.

38 (Previously Presented). The method of claim 33, wherein marking comprises setting at least one bit to indicate that the data is pinned.

39 (Previously Presented). The method of claim 38, further comprising storing the at least one bit in a volatile memory.

40 (Previously Presented). The method of claim 38, further comprising storing the at least one bit in the non-volatile cache memory, wherein the non-volatile cache memory is a non-volatile disk cache memory.

41 (Previously Presented). The method of claim 33, wherein the marking occurs during each initialization of the system.